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Scientific Survey Shows Promising Blue Crab Stock Abundance with Boost to Adult Females

~ Crab abundance remains substantial. Spawning-age females hit a record high. ~

HAMPTON, VA. – The Virginia Marine Resources Commission today released the results of the 2017 blue crab winter dredge survey, which shows a 31 percent increase in adult female crabs and forecasts another year of improved harvests.

This is the highest level of adult, spawning age females recorded in the 28 year history of the bay-wide crab winter dredge survey.

“The big picture is the stock overall is in pretty good shape,’’ said VMRC Commissioner John M.R. Bull. “This year’s harvest should be substantial and consumers should find plenty of tasty crabs for the dinner table. Challenges remain, however, and we need to remain vigilant and cautious in our management of this ecologically and economically important stock.”

The results of the 2017 winter dredge survey show the total population of blue crabs in the Chesapeake Bay fell a bit, by 18 percent, due to a decline in the number of juvenile crabs, but remains at the 11th highest level ever recorded by the winter dredge survey.

This year’s female spawning stock increased by 31 percent, from 194 million to 254 million crabs, which surpassed the scientifically recommended target of 215 million spawning female crabs and remains well above the minimum safe threshold of 70 million crabs.

Spawning age female crabs are the cornerstone to maintaining a vibrant crab stock, and depend on conservative and cooperative fishery management efforts among the Bay jurisdictions.

The adult male crab stock fell by 16 percent, from 91 million to a still-substantial 76 million.

However, the juvenile abundance plummeted by 54 percent, from 271 million to 125 million, which is the fourth lowest level on record.

This was unfortunate but not unprecedented. Optimal spawning conditions do not occur every year.

Successful crab reproduction naturally fluctuates and can be affected by wind, currents, storms, temperature, and cannibalism. In recent years, post-reproduction predation events and environmental factors have caused at times dramatic downturns in crab stock abundance. For example, the level of juveniles fell from 581 million in 2012 to a mere 111 million in 2013.

This reproductive variability highlights the need for fishery managers to continue to enhance resilience of the stock through adaptive management to compensate for unusual or extreme environmental conditions and the resulting impacts on reproductive success.

“Just three years ago, the number of adult female crabs were so low that a harvest cut was necessary to help rebuild them,’’ said Bull. “We are out of that danger zone, due to adaptive and effective management of this fishery. The spawning stock is in solid shape but more work needs to be done.”

A bay-wide 10 percent crab harvest reduction was enacted in 2014 by VMRC, Maryland, and the Potomac River Fisheries Commission to combat low overall crab abundance and to boost a dangerously depleted female spawning stock.

Bay fishery managers have since refined their management regimen to focus on conserving juvenile crabs as well as spawning age female crabs. Each year’s juveniles become the next year’s spawning stock. Adjusting catch regulations to conserve more of today’s juveniles from harvest when they reach market size in the fall and emerge in the spring after overwintering in the water bottom increases the likelihood they will survive to spawn another generation of abundant crabs in the summer.

“That would be prudent management,’’ said Rom Lipcius of the Virginia Institute of Marine Science. “Overall, I’m optimistic but we should remain cautious and risk-averse. Female numbers have increased in recent years. We’ve seen good male numbers. And the harvest has been increasing. We seem to be on the right track.”

The Bay-wide commercial harvest increased by 20 percent last year, from 50 million pounds to 60 million pounds, and remains at sustainable levels. Since 2014, the Bay-wide commercial crab harvest has jumped 71 percent while overall crab abundance has increased by 53 percent.

The current low level of juvenile crabs appears to preclude the reopening of the winter crab dredge fishery, which has remained closed since 2008.

The annual Bay-wide Winter Dredge Survey is the primary assessment of the Bay's blue crab population, and has been conducted annually by the Virginia Institute of Marine Science and Maryland's Department of Natural Resources since 1990. The survey employs crab dredges to sample blue crabs at 1,500 sites throughout the Chesapeake Bay from December through March. Sampling during winter when blue crabs are usually buried in the mud and stationary, allows scientists to develop, with good precision, estimates of the number of crabs present in the Bay.

The Chesapeake Bay Stock Assessment Committee (CBSAC), a subcommittee of the Sustainable Fisheries Goal Implementation Team, is reviewing the new survey results and will release their full analysis of the results in the 2017 Blue Crab Advisory Report this summer. The annual advisory report is used by managers as they review and update fishery regulations.

The Bay jurisdictions continue to work together cooperatively to manage the crab stock.

VMRC will begin discussions with its crab management advisory committee on options to adjust harvest restrictions while maintaining higher spawning-age female abundance and to improve reproduction so next year's juvenile levels improve. The Commission board will be briefed on the survey results at its April 25 meeting.

Below is the history of the Bay-Wide Winter Dredge Survey results (1990 through 2017). All surveys begin in December and ended in March of the next year.

Survey year	Total crab abundance (millions)	Juvenile crab abundance (millions)	Spawning-age female crab abundance (millions)	Bay-wide commercial harvest (millions of pounds)	Percentage of female crabs harvested (female exploitation fraction)
1990	791	463	117	104	30
1991	828	356	227	100	28
1992	267	105	167	61	37
1993	852	503	177	118	28
1994	487	295	102	84	36
1995	487	300	80	79	36
1996	661	476	108	78	25
1997	680	512	93	89	24
1998	353	166	106	66	43
1999	308	223	53	70	42
2000	281	135	93	54	49
2001	254	156	61	54	42
2002	315	194	55	54	37
2003	334	172	84	50	36
2004	270	143	82	60	46
2005	400	242	110	59	27
2006	313	196	85	52	31
2007	251	112	89	43	38
2008	293	166	91	49	21
2009	396	170	162	54	24
2010	663	348	246	85	16
2011	452	204	191	67	24
2012	765	581	95	56	10
2013	300	111	147	37	23
2014	297	199	69	35	17
2015	411	269	101	50	15
2016	553	271	194	60*	16*
2017	455	125	254	TBD	TBD

* 2016 harvest estimates and female exploitation fraction are preliminary.